



UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/897,613	07/03/2001	Hidetoshi Honbo	503.34465VV4	1835

20457 7590 03/23/2007
ANTONELLI, TERRY, STOUT & KRAUS, LLP
1300 NORTH SEVENTEENTH STREET
SUITE 1800
ARLINGTON, VA 22209-3873

EXAMINER

MAPLES, JOHN S

ART UNIT PAPER NUMBER

1745

SHORTENED STATUTORY PERIOD OF RESPONSE	MAIL DATE	DELIVERY MODE
3 MONTHS	03/23/2007	PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

If NO period for reply is specified above, the maximum statutory period will apply and will expire 6 MONTHS from the mailing date of this communication.

Office Action Summary	Application No.	Applicant(s)	
	09/897,613	HONBO ET AL.	
	Examiner	Art Unit	
	John S. Maples	1745	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 10 July 2006 and 15 December 2006.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 13,14,20,21,24,32 and 33 ~~is/are~~ pending in the application.
- 4a) Of the above claim(s) 24 ~~is/are~~ withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 13,14,20,21,32 and 33 ~~is/are~~ rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

Art Unit: 1745

1. Claim 24 is withdrawn from further consideration pursuant to 37 CFR 1.142(b) as being drawn to a nonelected invention, there being no allowable generic or linking claim. Election was made **without** traverse in the reply filed on 15 December 2006.

2. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

3. Claims 13-14, 20-21 and 32-33 are rejected under 35 U.S.C. 102(b) as being anticipated by Takami et al. (Takami)

Reference is made to column 2, lines 3-28 of Takami along with column 5, lines 50-64; column 7, lines 52-55; column 12, lines 10-31; column 13, lines 59-column 14, line 43; column 16, lines 17-64 and Example 27. In these portions, and especially in columns 13 and 14, Takami discloses the hexagonal crystal structure of the graphite (natural graphite-see column 7, lines 52-55) negative electrode and for the particle size thereof being in a range of less than 100 microns. As is well known in the art, there is at least a 3-5% amount of rhombohedral crystal structure present in the hexagonal graphite crystal negative electrode, which amount meets the claimed amount. In any event, applicant has used a lower range of 0% for the amount of rhombohedral crystal structure present in the anode graphite material in most of the claims and thus a

Art Unit: 1745

teaching of crystal graphite anode material absent rhombohedral type structure would meet the claimed subject matter.

Applicant's arguments have all been considered but are not deemed persuasive. Applicant argues that the graphite in Takami is not of an orderly and regular hexagonal crystal structure. The examiner respectfully disagrees. More specifically, applicant argues that Takami teaches a structure having crystallites and not crystals of the carbon material. Applicant further defines a difference between crystallites and a crystal according to Hawley's chemical dictionary. The applicant further states that Takami does not teach graphite powder having a crystal structure. The examiner respectfully disagrees.

It is noted that Takami sets forth in multiple places in the document, a carbonaceous material for the anode in a lithium secondary battery that is inherently of a hexagonal crystal structure. It is noted that applicant has not specifically addressed or traversed this argument in the amendment with remarks.

In addition, the graphite material in Takami has an exothermic peak and an intensity ratio of two different diffraction peaks obtained by X-ray diffraction analysis. See specifically, the abstract in Takami, column 3, lines 1-8, column 3, lines 56-60, column 6, lines 29-59, column 9, lines 14-28, column 10, lines 51-58, among many other portions in the patent. These values indicate a crystal structure for the entire anode material. A material would necessarily have to comprise an entire crystal structure to exhibit such analysis when undergoing X-ray diffraction procedures. It is noted that applicant previously acknowledged that such spectra exists for the carbon

Art Unit: 1745

anode material in Takami. Applicant states that the examiner has not provided evidence or support for the above argument. The examiner alleges that the spectral peaks are evidence enough.

Applicant argues that specific diffraction peaks are taught for both hexagonal and rhombohedral crystal structure for the claimed graphite material in the present claims and that Takami does not teach such. This may be true, however, in view of the fact that Takami sets forth both hexagonal and rhombohedral crystal structure as outlined previously in this action, this argument is traversed.

A further argument by applicant is that because of the amounts of the hexagonal and rhombohedral structure, improvements in capacity are achieved. Because Takami teaches the claimed amounts of both the hexagonal and rhombohedral crystal structure, the capacity of the battery in Takami would also be improved.

Applicant argues that with the amended terminology "substantially completely" a crystal structure, the claims now define over the Takami reference. This argument is not convincing. As stated in the previous paragraph, because the Takami patent repeatedly recites X-ray diffraction data, the structure of the graphite powder in Takami is necessarily completely crystal.

Applicant further mentions that Takami recites the carbon material having displacements, twists and angles of the hexagonal-net-plane layers, giving the size of the graphite structure and because of this disclosure, cannot be a completely crystal structure. This argument is deemed traversed by the arguments in this section.

Art Unit: 1745

Applicant also argues that the present invention does not include twisted structures. This may be true, however this language does not find support in the presently claimed invention.

In addition, as set forth in Takami and outlined in applicants' response, the carbon material in Takami does include crystallites, however, in view of the many portions in Takami where the above X-ray diffraction peaks are delineated, Takami sets forth an entire crystal structure for the carbon anode material. Thus Takami indeed discloses crystal structure that includes orderliness and regularity of the layers.

Applicant further argues that Takami does not have high crystallinity and has displacements, twists and angles unlike applicant's structure. This may be true, to some degree, however, applicant has not included claim language that covers these further limitations and thus applicant's arguments relating to these points are deemed moot.

4. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was

Art Unit: 1745

not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

5. Claims 13, 14, 20, 21, 32 and 33 are rejected under 35 U.S.C. 103(a) as being unpatentable over Flandrois et al.-US 5,554,462 (Flandrois).

Reference is made to the Abstract in Flandrois along with column 1, lines 26-40; column 5, lines 6-13, Example 1 and Example 3. Flandrois sets forth a graphite anode material (natural graphite-see column 1, lines 28-30) that includes both rhombohedral and hexagonal crystal structure in the claimed amounts. Flandrois sets forth in Example 3 a carbon containing material having less than 5% of rhombohedral phase. This is consistent with applicant's amount-see Table 1 in applicant's specification and the last entry therein.

The only claimed feature not shown or taught in Flandrois is the particle size of the graphite anode material being equal to or smaller than 100 microns. Example 3 of Flandrois sets forth graphite being ground in an impeller beaker for a minimum period of 15 minutes. It would have been obvious to one of ordinary skill in this art at the time the invention was made to have ground the graphite in Flandrois so that the size thereof would have been 100 microns or less because such size would allow the anode material to compact to a greater extent in the battery cell and produce the maximum amount of electrical output. It is also notoriously well known in the battery art to have the electrode powder be of this particle size.

Again, applicant's arguments have been considered but are not deemed persuasive. Applicant argues that the carbon anode is the cathode in the battery of Flandrois. This argument is not convincing because, for example, claim 9 of Flandrois sets forth the makeup of the cathode and the same is a transition metal oxide. Also, claim 1 of Flandrois sets forth the anode including graphite and a battery including a cathode and an electrolyte. Therefore, the carbon anode in Flandrois is indeed the anode as applicant is claiming.

Applicant further argues that Flandrois is concerned with increased rhombohedral structure while applicant is concerned with increased hexagonal crystal structure and decreased rhombohedral structure. This may be true, however, the claimed amounts of both hexagonal and rhombohedral are taught by Flandrois and so the claimed structure is met thereby.

Applicant argues that Flandrois does not teach natural graphite. Reference is made to lines 28-30 in Flandrois for such disclosure.

A further argument is that Flandrois does not teach a particle size of 100 microns. It is noted that applicant agrees that Flandrois would produce particles of this size during manufacture. The claims are met by such disclosure. This is because applicant has used the terminology "a particle size of the graphite powder is equal to or smaller than 100 microns". With Flandrois producing some particles of this size, this claim language is met by the teachings in Flandrois.

6. **THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

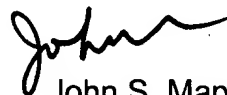
A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

7. Any inquiry concerning this communication or earlier communications from the examiner should be directed to John S. Maples whose telephone number is 571-272-1287. The examiner can normally be reached on Monday-Thursday from 6:15-3:45, and every other Friday.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Patrick Ryan can be reached on 571-272-1292. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Art Unit: 1745

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).



John S. Maples
Primary Examiner
Art Unit 1745

JSM/3-18-2007